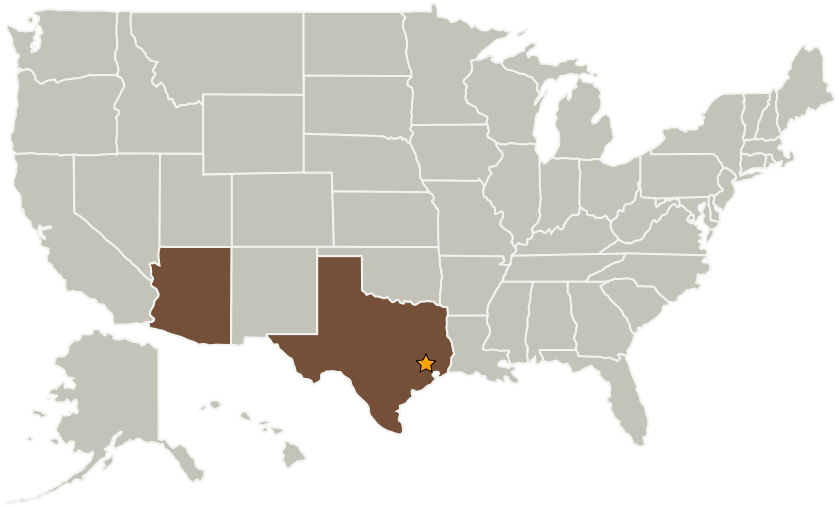
Integral Radiators for Next Generation Thermal Control Systems, Phase II

Completed Technology Project (2005 - 2006)

Project Introduction

Integral radiators integrate the primary structural system and the thermal rejection system into a dual function subsystem allowing for reduced weight. The design of these systems require a careful trade-off of thermal fluids, structural materials, thermal coatings and structural shape. The Paragon Crescent panels are a family of solutions that allow a highly efficient stressed skin, semi-monocoque structure to also be a radiator on the external surface of a Apollo-like Service Module as envisioned for the CEV. The resulting design optimizes the structural/thermal trade-off while allowing for practical considerations of manufacturability, ground handling, testing, and access. The baseline materials and fluids chosen address cost, safety and robust design. Some coating development is still needed to meet the handling requirements. The structural concept will need to be tested to validate modeling predictions and gain experience in structural behavior. Finally, full up radiator panels need to be manufactured and tested to validate the manufacturing methods, thermal analysis, and overall radiator/thermal fluid choices.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Paragon Space Development Corporation	Supporting Organization	Industry	Tucson, Arizona

Primary U.S. Work Locations	
Arizona	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.3 Heat Rejection and Storage